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Occultation observed at Highbury. By T. W. Burr, Esq.

1861, September 14th. The star ϱ *Capricorni* was occulted instantaneously by the dark limb of the Moon at $20^h\ 52^m\ 38^s{\cdot}9$ local sidereal time. Telescope 4 ft. 4 in. focus, $3\frac{3}{8}$ in. aperture, power 173. Longitude 24^s W.

Nov. 7th, 1861.

Places of the Comet II., 1861, *from Sextant-Observations of the Distances of the Comet from Fixed Stars, made by Commander A. L. Mansell, R.N., commanding H.M.S. Firefly, and reduced under the superintendence of the Rev. George Fisher, Principal of the Greenwich Hospital Schools, by the Officers of that Establishment.*

(*Communicated by the Astronomer Royal.*)

A short time since, the Admiralty placed in my hands a sheet of observations of the distances of the Comet II., 1861, from fixed stars, made by Commander A. L. Mansell, accompanied with the particulars which were absolutely necessary for their reduction, but with nothing tending to facilitate the reduction. At my request, the Rev. George Fisher most kindly took charge of the observations, and under his care they were reduced by the Officers of the Greenwich Hospital Schools.

The observations were made on board H.M.S. Firefly, her anchorage being within a quarter of a mile of the observatory-station used in the survey of Sidon, the position of which is— latitude $33^\circ\ 34''\ 26'$ N., longitude $35^\circ\ 21'\ 39''$ E. The latitude is determined from a mean of four meridian altitudes of α and β *Libræ* south of the zenith, and ten observations of *Polaris*, using the *Nautical Almanac* method. The longitude is determined from three good meridian distances from Beirut, using eight chronometers; Beirut being fixed by a mean of seven meridian distances, using seven chronometers, run between it and Malta. The longitude of Malta is deduced from that of the Observatory at Palermo. [It will be remarked, in the subsequent computations, that a small error of latitude produces no error in the deduced place of the comet, except in so far as it alters the computed altitude of the star and comet, and therefore slightly alters the refraction and the correction of distance; and a small error of longitude produces no effect, except in the correction of distance for refraction, and in the computation of the comet's place from the Ephemeris.] Mean time was deter-

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mined by equal altitudes of the Sun on the 2d and 8th of July. $\frac{210}{3063}$ is a good pocket-chronometer, by French: it has however always been compared with the standard chronometer (Dent, 1793), which watch shows a good mean of the nine chronometers.

The elements given are—the Greenwich mean time of each observation, and the observed distance, index-error, and corrected apparent distance.

It does not appear necessary to give all the numbers of the observations, or the troublesome reductions, but it may be proper to describe the method pursued:—

1. The Comet's R.A., N.P.D., and log. distance were interpolated from the Ephemeris published by M. Le Verrier in the *Bulletin.* The hour-angle being found, the true altitude was computed; and by calculation of refraction and parallax, the apparent altitude was found.

2. The Star's R.A. and N.P.D. being taken from the *Nautical Almanac*, its true altitude was computed, and by calculation of refraction the apparent altitude was found.

3. From the two apparent altitudes and the measured distance, with the corrections of altitudes, the true distance was found by the usual method of clearing Lunars.

4. The distances of the Comet from the two stars were measured at different times. But on each of the evenings the distance of the Comet from at least one star was measured twice; and the change of distance for a known interval being thus found, it was always possible to reduce to the same moment the measures of distance from two stars.

5. With the R.A. and N.P.D. of the two stars, the distance between them was soon found, and the angle made by that distance with the meridian of one star. The three sides of the triangle formed by the Comet and two stars being known, the angle at the star last mentioned was computed. Applying this angle to the angle just mentioned, the angle made by the Comet's distance with the star's meridian was found. The necessary elements for computing its diff. R.A. and its N.P.D. were thus completely obtained.

The following are the results for the Comet's place:—

Day.	G.M.T.	Comet's R.A.	Comet's N.P.D.	Stars from which the Comet's Distance was measured.
1861.	h m s	h m s	° ′ ″	
July 1	6 17 30	7 17 43·75	35 49 19·3	Polaris, Spica.
	6 21 13	7 17 54·55	35 45 24·7	Spica, α Coronæ.
	6 40 53	7 18 37·46	35 43 37·5	Polaris, Spica.
	6 42 25	7 18 43·80	35 39 39·4	Spica, α Coronæ.
2	6 6 17	8 17 30·55	28 40 28·4	Polaris, Spica.
	6 9 28	8 17 48·02	28 36 30·0	Spica, α Coronæ.
	8 52 33	8 25 7·69	28 3 56·1	Polaris, Spica.

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Day.	G.M.T.	Comet's R.A.	Comet's N.P.D.	Stars from which the Comet's Distance was measured.
1861.	h m s	h m s	° ′ ″	
July 2	8 58 24	8 25 27·25	28 1 0·3	Spica, α Coronæ.
4	6 11 2	10 38 18·35	23 6 1·4	Spica, α Coronæ.
	6 15 19	10 37 49·00	23 9 9·7	Polaris, Spica.
5	7 44 33	11 39 5·43	23 32 3·8	Polaris, Arcturus.
	7 46 52	11 39 14·10	23 31 33·6	Arcturus, α Lyræ.
6	8 28 11	12 21 59·50	24 51 2·6	Polaris, Arcturus (not favourable).
	8 30 37	12 22 57·85	24 47 42·5	Arcturus, α Lyræ.
8	6 23 16	13 14 31·54	27 42 22·0	Polaris, Arcturus (unfavourable).
	6 29 40	13 14 43·99	27 42 38·1	Arcturus, α Lyræ.
9	6 32 26	13 31 43·01	29 9 5·8	Polaris, Arcturus (unfavourable).
	6 36 10	13 32 12·24	29 8 35·3	Arcturus, α Lyræ.
10	6 24 29	13 43 48·79	30 26 10·4	Polaris, Arcturus (unfavourable).
	6 28 28	13 45 33·27	30 24 20·3	Arcturus, α Lyræ.

November 4, 1861.

Places of Comet II. 1861. By N. M. R. Edmondson, Esq., Assistant, Armagh Observatory.

(*Communicated by Dr. Robinson.*)

G.M.T.	R.A.	Par. in R.A.	N.P.D.	Par. in N.P.D.
	h m s	s	° ′ ″	″
July 1·4516	7 28 6·38	$+ \varpi \times$ 0·0406	34 17 24·94	$- \varpi \times$ 0·8468
2·5157	8 36 7 *		27 20 *	
5·4739	11 46 52·63	0·0965	23 44 3·01	0·3383
6·4883	12 28 16·27	0·0908	25 18 19·22	0·3200
7·4954	12 57 27·90	0·0864	26 32 1·64	0·3088
9·4864	13 34 59·05	0·0755	29 25 58·07	0·2480
10·4464	13 47 43·69	0·0628	30 39 20·46	0·1304
14·4583	14 18 48·34	0·0570	34 36 52·47	0·1968
16·4787	14 27 38 *		36 5 *	
18·4496	14 34 43·12	0·0515	37 13 3·49	0·2143
21·4722	14 42 27 *		38 34 *	
23·4581	14 46 32·56	0·0520	39 26 16·47	0·2798

* Approximate.